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REQ. NO. 8-9136

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DECEMBER 18, 1979

MINING RESEARCH LABORATORIES
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ELLIOT LAKE, ONTARIO
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ATTN: MR. D. MURRAY

CONTRACT REPORT NO. 0SQ79-00029

DEAR SIRS:

RE: REPORT - VEGETATION OF URANIUM MILL TAILINGS AT ELLIOT LAKE, ONTARIO

OBJECTIVE:

TO STABILIZE AND VEGETATE URANIUM TAILINGS WITH A TYPE OF VEGETATION, THAT REQUIRES LITTLE OR NO CARE, BECOMES MORE OR LESS MAINTENANCE-FREE OVER A SPAN OF ABOUT SIX YEARS AND OPENS THE SOIL FOR THE ESTABLISHMENT OF VOLUNTARY GROWTH OF SPECIES OF NATIVE TREES AND PLANTS. URANIUM TAILINGS CONTAIN CONSIDERABLE AMOUNTS OF PYRITE AND ARE THEREFORE HIGHLY ACID: TO NEUTRALIZE SUCH ACIDITY REQUIRES LARGE AMOUNTS OF LIMESTONE. THIS LIMESTONE IS SPREAD EVENLY OVER THE SURFACE AND CULTIVATED INTO THE TAILINGS. FERTILIZER AND SEED ARE THEN APPLIED. THE SEED MIXTURE CONTAINS VARIOUS GRASSES FOR TEMPORARY COVER AND BIRDSFOOT TREFOIL (LOTUS CONICULATUS) FOR PERMANENT GROWTH. TREFOIL IS A LEGUMINOUS PLANT, IT EXTRACTS AIRFREE NITROGEN FROM THE ATMOSHERE AND STORES IT INTO THE SOIL.

METHOD OF WORK:

IN ORDER TO OBTAIN A REASONABLE IMPRESSION OF THE PROBLEMS INVOLVED IN CARRYING OUT THIS KIND OF WORK, A WET AND UNSTABLE PLOT WAS SELECTED FOR THE TRIAL. ONE GOTRAC 600 CARRYING A 6 TO LIMESPREADER AND ONE FN60 NODWELL CARRYING A 3 TO LIMESPREADER WERE USED TO SPREAD THE LIME. BOTH MACHINES WERE LOADED WITH A 1½ YD FRONT END LOADER. ALTHOUGH NO TECHNICAL DIFFICULTIES WERE ENCOUNTERED, GREAT CARE HAD TO BE TAKEN TO HAVE THE GOTRAC ONLY ON A MORE STABLE AREA; WHEREAS THE FN60, WITH ITS WIDE TRACKS, WAS USED ON THE SOFT AND SLIMY AREAS. HOWEVER, THE OPERATION HAD TO BE SHUT DOWN ON NUMEROUS OCCASIONS BECAUSE OF HEAVY RAIN.

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FOR THE NECESSARY SWALING AS WELL AS CULTIVATING, DISCING, FERTILIZING AND SEEDING TWO JD350 CRAWLERS WITH FLOTATION TRACKS, POWER TAKE OFF AND THREE POINT HITCH WERE USED. THOSE MACHINES ENCOUNTERED ONLY THE NORMAL DIFFICULTIES AGAIN DUE TO HEAVY RAIN WHICH PUT A GREATER STRAIN ON THE RUNNING GEAR AS IS NORMAL WITH THIS TYPE OF HIGH MAINTENANCE EQUIPMENT. THE IMPLEMENTS THAT WERE USED IN CONJUNCTION WITH THE JD350 CRAWLER BROKE DOWN ONLY ALONG THE PERIMETER DUE TO ROCKS AND BOULDERS THAT STUCK OUT OF OR WERE BURIED BENEATH THE SURFACE.

SCHEDULE OF WORK:

TO PROVIDE ACCESS TO THE ENTIRE AREA FOR MECHANICAL SEEDING, A DRAINAGE PATTERN HAD TO BE LAID OUT AND CONSTRUCTED. JD350 WIDE TRACK BULLDOZERS WERE USED FOR THIS TASK. AFTER DRAINAGE WAS PROVIDED AND TOOK EFFECT, 30 TONS OF LIMESTONE PER ACRE WERE APPLIED BY GOTRAC 600 WITH 6 TON CAPACITY SPREADER FOR THE STABLE AREAS AND FN60 NODWELL WITH A 3 TON SPREADER FOR THE UNSTABLE AND SLIMY AREAS. AFTER THE LIMESTONE WAS APPLIED, IT NEEDED TO BE MIXED INTO THE TOP 6" OF THE TAILINGS. A THREE POINT HITCH MOUNTED DISC WAS USED ON THE COARSE TAILINGS TWICE OVER IN A CROSS PATTERN AND A SPRINGTOOTH CULTIVATOR WAS USED FOR THE FINE TAILINGS AGAIN IN A CROSS PATTERN. AFTER THE CULTIVATING WAS COMPLETED, 200 LBS/PER ACRE OF 10-20-20 FERTILIZER WERE APPLIED BY CYCLONE SPREADER, A THREE POINT HITCH MOUNTED 1 TO LILY SPREADER WITH AN ACCURATE METERING DEVICE AND KNOWN FOR ITS PRECISE APPLICATION. IMMEDIATELY AFTER, THE AREA WAS HARROWED WITH A 14' CHAIN HARROW TO BREAK UP THE LARGER LUMPS AND TO PREPARE THE FINAL SEEDBED. THE SEEDING WAS, AGAIN DUE TO THE NATURE OF THE TAILINGS, CARRIED OUT BY DIFFERENT MEANS. ON THE COARSE AND WELL DRAINED TAILINGS, A BRILLION SEEDER APPLIED BOTH, 60 LBS. OF SEED CONTAINING RED TOP CREEPING RED FESQUE AND BIRDSFOOT TREFOILSEED AND 100 LBS. OF 0-46-0 FERTILIZER PER ACRE. ON THE FINE TAILINGS AREA, THE SEED AND FERTILIZER WERE APPLIED BY CYCLONE METHOD AND AGAIN HARROWED INTO THE TOP ½" BY A CHAIN HARROW.

CONCLUSION:

GERMINATION TOOK PLACE WITHIN EIGHT DAYS AFTER COMPLETION OF THE WORK. ONLY ONE PORTION OF THE AREAS LACKED GROWTH. THIS WAS DUE TO A HEAVY RAIN WHICH WASHED THE SEED INTO A LOWER PART OF THE PLOT. THE WASHED OUT PORTION WAS RE-SEEDED BY CYCLONE SPREADER DURING THE MAINTENANCE FERTILIZING, WHICH WAS DONE IN AUGUST WITH 200 LBS. OF 10-20-20 PER ACRE.

RESPECTFULLY YOURS,

EROCON LIMITED

H. KELLER, PRESIDENT.